



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Post Office Box 845  
Cookeville, TN 38503



October 5, 1989

Mr. Patrick Tobin, Director  
Waste Management Division  
U.S. Environmental Protection Agency  
Region IV  
345 Courtland Street NE.  
Atlanta, GA 30365

Dear Mr. Tobin:

This responds to a request from your agency asking the U.S. Department of the Interior to review the Draft Sampling Plan for the Carrier Air Conditioning (CERCLA) Site in Collierville, Tennessee. Mr. Jim Lee, the Department of the Interior's Regional Environmental Officer, forwarded the draft plan along with your request for review to our office.

Our review of the draft sampling plan indicates that EPA has done a good job of planning a sampling scheme that will determine whether or not the Carrier Air Conditioning Site represents a direct hazard to human health. However, in addition to the various potential contaminant migration pathways that the sampling plan proposes to examine, there should also be an analysis of potential bioexport pathways. Bioexportation of contaminants refers to the biological uptake of toxic substances by living organisms (in the form of a contaminant body burden), which are then transported off-site as the organisms migrate to other locations. An example of this would be fish that ingest or absorb a contaminant body burden from a portion of a stream impacted by contaminant releases from a CERCLA site, which subsequently migrate to another location where they are caught and eaten by fishermen. This form of contaminant bioexport presents a human health hazard that should be addressed, realizing of course, that such occurrences are more likely to occur at some CERCLA sites than at others. Similar public health concerns may also apply to popular game animals, birds and in some instances, possibly to edible wild plants and fruits.

Although contaminant bioexport may not always create a concern for public health, it nearly always is an issue of concern for the nonhuman portion of the environment (i.e., environment in the ecological sense). Herein lies the major deficiency of the draft sampling plan: it fails to propose a sampling scheme capable of yielding definitive information about site-related impacts upon the ecosystem. For example, the draft sampling plan does not contain a proposed methodology for quantifying the effects of site-related releases upon aquatic or terrestrial wildlife, essential components of the food chain (biotic contamination), threatened, endangered or rare wildlife or plants, sensitive environmental areas, critical habitats, or other aspects of the affected environment.



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The last sentence of the sampling methodologies section of the draft plan mentions that "a biological population study will be performed by a local investigator". This was the only indication that we found in the draft sampling plan where sampling was proposed specifically for the purpose of investigating the effects of site-related releases upon "the environment". All of the other sampling methodologies proposed in the draft plan seemed to be geared towards determining if any human health impacts are associated with the Carrier Air Conditioning Site. The fact that there is no specific mention of what kinds of biological populations will be sampled (i.e., aquatic or terrestrial wildlife, invertebrates, etc.), no indication of what sampling methodologies will be employed, or even a reason stated showing the need for a population investigation seems incongruous with the rest of the draft plan which describes proposed soil, air and water sampling in detail. EPA has published guidance to help Remedial Project Managers develop sampling plans for ecological assessments at CERCLA sites. \*

A biological population investigation is unlikely to produce much information that will help quantify the effects of site-related releases upon the environment. This will be particularly true if recent, accurate documentation (both prior to and during releases from the site) of biotic communities are unavailable for the affected area. We suggest that you first screen a few tissue samples from small mammals, fish and plants collected within the affected area for evidence of contaminant accumulation or bioconcentration. Secondly, since volatile organic contaminants (i.e., trichlorethylene) are unlikely to accumulate or concentrate to a significant degree in tissue, a further examination of the respiratory system, heart, liver, kidneys and possibly other organs and systems of small mammal and fish samples collected in the affected area should be performed by competent veterinary toxicology and histopathology labs. The information provided by this type of testing will indicate whether or not there are site-related mutagenic, oncogenic, teratogenic and/or other lethal and sublethal impacts occurring to food chain organisms. Finally, some soil, sediment, and water bioassays using biological indicator organisms such as daphnids, Microtox (luminescent bacteria) or fathead minnows would be helpful in determining the degree of toxicity (and thus the relative environmental hazard) that releases from the Carrier Air Conditioning Site pose to environmental receptors.

The following is a priority ranking (in terms of data usefulness) of the previously-discussed generalized methods of biological hazard investigation, along with a brief description of the type of information each technique yields.

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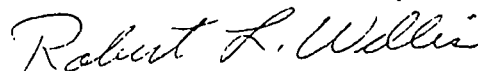
\* Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (Interim Final). OSWER Directive 9355.3-01. EPA Office of Emergency and Remedial Response, October 1988.

1. Bioassays - These types of studies indicate whether or not site-related releases are potentially toxic, along with the degree of potential toxicity to environmental receptors.
2. Tissue Analysis - These studies indicate whether or not contaminants are present in the tissues of environmental receptors.
3. Toxicological/Histopathological Analysis - These types of studies indicate whether or not toxic substances that may be emanating from the site are actually causing deleterious effects in environmental receptors and describe the nature of the effects.
4. Population Investigations - (biological community investigations)- Provided that good historical (prior to releases from the site) data is available, these methods may indicate that certain sensitive environmental receptors are absent from the biological community, "possibly as a result of site related releases". However, since other environmental factors (e.g., climatic extremes) also can result in a decline or disappearance of sensitive environmental receptors, the data generated by biological population investigations tends to be highly ambiguous.

In this letter we have tried to indicate what types of biological investigations are most helpful in determining site-related environmental risks. Without the kind of data provided by bioassays, tissue analyses, toxicological and histopathological investigations, agencies charged with protecting natural resources and other aspects of the environment can merely speculate about the degree of risk associated with releases from the Carrier Air Conditioning Site at Collierville, Tennessee.

If you have any questions regarding the contents of this letter, please contact Mark Wilson, our staff Contaminant Specialist, at (615) 528-6481. Mr. Wilson will be happy to provide technical assistance or other help you may need to fully assess the environmental risks associated with the Carrier Air Conditioning Site. If you do not have a readily available capability to conduct site-related biological assessments, the Fish and Wildlife Service might be able to perform such a task on a cost-reimbursable basis through a regional interagency agreement.

Sincerely,



Robert L. Willis  
Acting Field Supervisor

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USDOJ, REO, Region IV, Atlanta, GA

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U.S. EPA, Water Management Division, Atlanta, GA (Attn: Ron Landy)